DOCUMENT RESUME

ED 359 216 TM 019 843

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TITLE Goals and Progress Feedback: Effects on Self-Efficacy and Writing Achievement.
PUB DATE Apr 93
NOTE 17p.; Paper presented at the Annual Meeting of the American Educational Research Association (Atlanta, GA, April 12-16, 1993).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Comparative Testing; *Elementary School Students; *Feedback; Grade 4; Intermediate Grades; Outcomes of Education; Pretests Posttests; Scores; *Self Efficacy; Sex Differences; Skill Development; *Transfer of Training; *Writing Achievement; Writing Tests
IDENTIFIERS *Goal Setting; Process Goals; Progress Monitoring; *Progress Reporting; Strategy Training

ABSTRACT

This study assessed how goal setting and progress feedback affect self-efficacy and writing achievement for 20 male and 20 female fourth graders. Children received writing strategy instruction and were given a process goal of learning the strategy, a product goal of writing paragraphs, or a general goal of working productively (control condition). Half of the process-goal children periodically received feedback on their progress in learning to use the strategy. The transfer (maintenance and generalization) of achievement outcomes was also studied. Process goal plus feedback subjects: (1) outperformed the control group on posttest self-efficacy and skills, self-efficacy for improvement, and perceived progress in strategy learning; (2) scored higher than did product goal children on posttest skill and perceived progress; (3) wrote more words per unit and judged posttest strategy use and strategy value higher than did product and general goal students; and (4) performed better on the maintenance test than did general goal children. Students who received the process goal without progress feedback scored higher on writing skill and wrote more words per unit than did general goal students. The product and general goal conditions did not differ on any measure. Self-efficacy correlated positively with strategy use and skill on posttest and maintenance tests. One table presents means and standard deviations.
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Goals and Progress Feedback: Effects on Self-Efficacy and Writing Achievement

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ED359216

Abstract

This experiment investigated how goal setting and progress feedback affect self-efficacy and writing achievement. Children received writing strategy instruction and were given a process goal of learning the strategy, a product goal of writing paragraphs, or a general goal of working productively (control condition). Half of the process-goal children periodically received feedback on their progress in learning to use the strategy to write paragraphs. We also explored transfer (maintenance and generalization) of achievement outcomes. Process goal plus feedback subjects: (a) outperformed general goal students on posttest self-efficacy and skill, self-efficacy for improvement, and perceived progress in strategy learning; (b) scored higher than product goal children on posttest skill and perceived progress; (c) wrote more words per T-unit and judged posttest strategy use and strategy value higher than product and general goal students; and (d) performed better on the maintenance test than general goal children. Students who received the process goal without progress feedback scored higher on writing skill and wrote more words per T-unit than general goal students. The product and general goal conditions did not differ on any measure. Self-efficacy correlated positively with strategy use and skill on the posttest and maintenance test.

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Goals and Progress Feedback: Effects on Self-Efficacy and Writing Achievement

There is much evidence that goal setting promotes motivation and learning (Bandura, 1986; Locke & Latham, 1990). The effects of goals are not automatic, however, but rather depend on goal properties: specificity, proximity, difficulty. Goals that denote specific performance standards are more likely to enhance behavior than general goals (e.g., "Do your best"). Goals temporally close at hand raise performance better than distant goals. Challenging but attainable goals increase motivation and learning better than goals perceived as very easy or overly difficult (Schunk, 1991).

The effects of goals on behavior also depend on self-efficacy, or beliefs about one's capabilities to perform actions at designated levels (Bandura, 1986, 1988). Self-efficacy can affect choice of activities, effort, and persistence. When students adopt a goal they may experience a sense of self-efficacy for attaining it. Their initial sense of efficacy is substantiated as they work on the task and observe goal progress because perceived progress conveys they are becoming skillful. In turn, heightened capability evaluations sustain motivation and lead learners to establish new goals when they attain their present ones (Schunk, 1991).

Goal setting research has focused on such product goals as rate or quantity of work (Bandura & Schunk, 1981; Morgan, 1985; Rosswork, 1977; Schunk, 1991). In contrast, process goals involve techniques and strategies students use to learn (Weinstein & Mayer, 1986). One type of process goal is to acquire a learning strategy, or systematic plan for improving information processing and task performance (Weinstein, Goetz, & Alexander, 1988). Research in various domains shows that students taught strategies typically improve their skills (Borkowski, 1985; Borkowski, Estrada, Milstead, & Hale, 1989; Pressley et al., 1990; Romberg & Carpenter, 1986), and that use of effective strategies correlates positively with self-efficacy (Pintrich & De Groot, 1990; Zimmerman & Martinez-Pons, 1990).

In a recent study, Schunk and Swartz (1991) compared the effects of process and product goals on writing outcomes among average-achieving fifth-grade children. Applying goal setting to children's writing fits well with contemporary theories viewing writing as a problem-solving process that reflects goal-directed behaviors (Flower & Hayes, 1981; Scardamalia & Bereiter, 1986). Writers generate goals and refine or alter them as they compose. Despite this theoretical importance, prior research had not explored the effects of process and product goals during children's writing.

Schunk and Swartz (1991) also examined the role of self-efficacy. Self-efficacy theory predicts that students with higher self-efficacy should be likely to choose to write and expend effort and persist if they encounter difficulty (Schunk, 1989). In turn, successful writing enhances self-efficacy for continuing to write well. Graham and Harris (1989a, 1989b) found that strategy instruction improved learning disabled students' skills, efficacy, strategy use, and transfer, and Shell, Murphy, and Bruning (1989) obtained a positive relation between self-efficacy and writing achievement among adults, but efficacy research was lacking with elementary students in regular classes.

Schunk and Swartz gave children strategy instruction and a process goal of learning the strategy, a product goal of writing paragraphs, or a general goal of working productively. Some process-goal children received feedback on their progress in learning the strategy; it was felt that children might have difficulty determining progress on their own and perceived progress is necessary to raise efficacy. The process goal with progress feedback enhanced writing skill, self-efficacy, strategy use, and transfer; the process goal without feedback provided some benefits; the product goal offered little advantage over the general goal.

The researchers suggested that the process goal highlighted strategy use as a means to improve writing. Students may have experienced a sense of efficacy for learning the strategy, which was substantiated as they wrote. Students who believe they are learning a useful strategy feel efficacious about improving their writing and motivated to apply the strategy, which increase skills and transfer (Schunk, 1989). Providing no explicit goal or a goal of writing paragraphs may not have conveyed the strategy's importance. Learners who believe that a strategy does not contribute much do not employ it systematically or feel confident about learning (Borkowski, 1985). Progress feedback may have conveyed that the strategy was effective, students were making progress, and they were capable of continuing to improve (Borkowski, Weyhing, & Carr, 1988). Progress feedback seems beneficial during writing because children often have difficulty assessing their skills and determining whether strategy use is effective (Hillerich, 1985).

In the present study we replicated the Schunk and Swartz (1991) methodology and attempted to expand the generality of their results. We used a sample of fourth graders to determine if their findings could be replicated with younger children. We also assessed transfer (maintenance and generalization) of strategy use, self-efficacy, and skill, over time and across writing tasks. Evidence for transfer in strategy instruction studies is mixed (Borkowski, 1985; Borkowski, Johnston, & Reid, 1987; Pressley et al., 1990). Graham and Harris (1989b) obtained positive results when they taught learning disabled students a strategy for writing essays. Instruction improved essay quality, gains were maintained up to 12 weeks following training, and skills and strategy use generalized to writing stories. In a similar study, learning disabled children received strategy instruction on writing stories (Graham & Harris, 1989a). Training improved students' use of story grammar elements, gains were maintained after two weeks, and outcomes generalized to the resource room. In both studies, strategy instruction raised self-efficacy. Research has not examined whether process goals and progress feedback encourage transfer.

We predicted that the process goal would lead to better maintenance and generalization than the product goal, and that progress feedback would further enhance transfer. We expected that the process goal and the progress feedback would raise children's perceptions of strategy usefulness and self-efficacy. We thought that children who felt confident about using a strategy they believed helped them perform better would apply the strategy diligently while writing, which enhances skill acquisition, retention, and transfer (Baker & Brown, 1984; Borkowski, 1985).

Method

Subjects

Subjects (N = 40, 20 boys, 20 girls) were fourth graders drawn from two classes in one school. Ages ranged from 9.2 to 11.8 years (M = 10 years 2 months). Ethnic composition was 19 Anglo American, 19 African American, 1 Hispanic American, 1 Asian American. Teachers initially nominated 45 children who received language arts instruction in regular classes and experienced no problems comprehending oral instructions. Three students were dropped because they missed instructional sessions. We randomly excluded the data of two other students from the appropriate cells to equalize sizes.

Pretest

Pretest. The pretest, which comprised measures of self-reported strategy use, self-efficacy and achievement, was administered by a tester from outside the school. The test of self-reported use of the steps in the writing strategy included five scales ranging in 10-unit intervals from 0—not at all, to 100—a whole lot. Scale labels were: write ideas, pick main idea, plan paragraph, write topic sentence, write other sentences. Children thought about times they wrote paragraphs and marked how often they performed each step. Scores were averaged across the five judgments.

The self-efficacy test assessed children's perceived capabilities for performing five tasks associated with paragraph writing: generate ideas, decide on the main idea, plan the paragraph, write the topic sentence, write the supporting sentences. The efficacy scale ranged in 10-unit intervals from not sure—10, to really sure—100. Children learned the meaning of the efficacy scale's direction and numerical values by judging their certainty of successfully jumping progressively longer distances.

Following this practice, the tester explained the distinguishing characteristics and read a sample for each of six types of paragraphs: descriptive, informative, narrative story, narrative descriptive, classificatory, expressive. The first four were included in the ensuing instructional program whereas the latter two were not and represented measures of generalization of self-efficacy and skills across writing tasks. Children were told that descriptive paragraphs discuss objects, events, persons, or places (e.g., describe someone in your family). Informative paragraphs convey information effectively and correctly (write about the Civil War battle at Gettysburg). Narrative story paragraphs contain events sequenced in order from beginning to end (tell a story about visiting a friend or relative). Narrative descriptive paragraphs sequence steps in the order to be followed to perform a task (describe how to play your favorite game). Classificatory paragraphs involve comparing, contrasting, and noting similarities and differences (describe how birds and people are alike and different). Expressive paragraphs express ideas and feelings about hypothetical situations (tell how you would feel if it rained every day of the year).

When the tester finished, children privately judged self-efficacy for performing the five tasks for each of the six paragraph types (30 total judgments). Specifically, for each type of paragraph children judged their capabilities for generating at least five or six ideas, thinking of a good

main idea, planning the paragraph (deciding which ideas to include and what order to put them in), writing a clear topic sentence that could be understood by readers, writing clear supporting sentences that could be understood by readers. The 30 scores were summed and averaged.

The reliability of the self-efficacy instrument was assessed using 12 children who did not participate in this study but completed the efficacy test twice (two weeks apart); test-retest r = .91. Cronbach's alpha for participating children was .88.

The writing achievement test was administered after the efficacy assessment. Children were given six paragraph topics, each of which represented one of the six paragraph types. The quality of subjects' paragraphs was assessed with four holistic scales that included the following categories drawn from different sources (Hillerich, 1985; Odell, 1981; Shell et al., 1989): organization, sentence structure and word choice, creativity, style to fit purpose. These categories were included because we felt that the strategy instruction and the goals might influence them. For each category, ratings were made on a 4-point scale ranging from 1 (low) to 4, for a total skill score ranging from 4 to 16. Each paragraph was scored independently by two individuals; for the data analyses their scores were averaged to provide a single score for each paragraph for each subject.

Paragraphs also were scored for words per T-unit. A T-unit is a main clause plus attached subordinate clauses (Odell, 1981). Words per T-unit is a measure of syntactic fluency and a reliable indicator of sophistication in writing skill (Hillerich, 1985). Words per T-unit were averaged across paragraphs for each child.

Three different forms of the skill test were developed; these forms included the same six paragraph types but different topics. The parallel forms were used on the pretest, posttest, and maintenance test, to eliminate potential effects due to topic familiarity. Twelve children not participating in the study completed these three tests; range of rs for holistic scores = .78 to .88. Cronbach's alpha for the skill pretest was .82.

Instructional Program

Children were assigned randomly within gender and classroom to one of four experimental conditions (n = 15 per condition): product goal, process goal, process goal plus progress feedback, instructional control (general goal). All students received 45-minute instructional sessions over 20 days; five days each were devoted to descriptive, informative, narrative story, and narrative descriptive paragraphs. Children assigned to the same condition met in small groups with a teacher from outside the school.

The procedure during the five sessions devoted to each type of paragraph was identical. At the start of the first session, a tester administered to children a measure of self-efficacy for improving their writing skills for the type of paragraph to be covered. This assessment was identical to that of the pretest except that children judged the five tasks only for the paragraph type to be covered during the next five sessions and they assessed their capabilities for improving their skills at the tasks rather than for being able to perform them. For each assessment, the five scores were averaged.

Following this assessment, the teacher introduced the session by stating that they would be working together on writing and by referring to the writing strategy. This strategy, which was displayed on a poster board, was as follows:

> What do I have to do? (1) Choose a topic to write about. (2) Write down ideas about the topic. (3) Pick the main idea. (4) Plan the paragraph. (5) Write down the main idea and the other sentences.

The teacher reiterated the type of paragraph children would be working on that week and gave the goal instructions appropriate for children's experimental assignment (discussed in next section). The teacher then modeled the strategy and its application by stating, "What do I have to do? Choose a topic to write about." The teacher stated a topic and wrote it on the board. The teacher then stated, "What do I have to do next? Write down ideas about the topic." The teacher generated ideas and wrote them on the board. After the teacher generated 8-12 ideas, the teacher said, "What do I have to do next? Pick the main idea." The teacher stated that the main idea represented what all the ideas were trying to say about the topic. The teacher explained what the ideas had in common, verbalized a main idea, and wrote it down.

Following this modeled demonstration (about 10 minutes), students received guided practice in generating ideas and the main idea for about 15 minutes. The teacher generated another topic and repeated the procedure except that the teacher called on individual children to supply ideas about the topic. After a sufficient number of ideas had been generated, the teacher asked children what the ideas had in common and what would be a good main idea. On completion of this paragraph, the teacher repeated the guided practice procedure using a second paragraph. After completing the second paragraph, the teacher verbalized another paragraph topic and explained that children would generate ideas and the main idea on their own. Children engaged in independent practice for the remainder of the period (about 20 minutes); the teacher periodically monitored their work.

At the start of the second session, the teacher gave the appropriate goal instructions and briefly reviewed previous work. The teacher produced the ideas for the initial topic and explained they would work on step 4—plan the paragraph. The teacher explained that planning referred to deciding which ideas to include and in what order to put them. The teacher modeled the planning process by constructing a web (map) consisting of a box in the center and lines emanating from it (Hillerich, 1985). The teacher put the main idea in the box and the other ideas at the ends of the lines. To show organization, the teacher ordered the ideas starting at the top and working around the box. Following this modeled demonstration, the teacher reconstructed the ideas for the other two topics covered during guided practice of session one and asked for students' input for ideas to include and their order. During the independent practice portion of this session, children planned the paragraphs they worked on during the first session.

The third session was devoted to translating ideas into the topic sentence and supporting sentences. After giving the appropriate goal, the teacher reviewed prior work. The teacher verbalized the last step in the strategy, and wrote the paragraph by translating each idea into a sentence. After completing this paragraph, the teacher gave students guided practice by

putting the webs on the board and calling on students to translate ideas into sentences. Students completed the session engaged in independent practice.

Sessions four and five followed a similar format. During session four the teacher modeled the strategy with a new topic, and engaged the group in guided practice on another topic. The teacher then gave the group independent practice, during which they applied the entire strategy. During session five the modeled demonstration was not included. Children received guided practice and then worked independently while the teacher monitored.

Experimental Conditions

The goal information given to students in the different conditions was as follows. To children assigned to the process goal and the process goal plus progress feedback conditions the teacher said during the first five sessions:

> While you're working it helps to keep in mind what you're trying to do. You'll be trying to learn how to use these steps to write a descriptive paragraph.

These instructions were identical for the other sessions except that the teacher substituted the name of the appropriate type of paragraph. Children assigned to the product goal condition were told the following at the start of the first five sessions:

> While you're working it helps to keep in mind what you're trying to do. You'll be trying to write a descriptive paragraph.

For the remaining sessions the teacher substituted the name of the appropriate paragraph type. The goal instructions given to instructional control students were, "While you're working, try to do your best." The latter condition controlled for the effects of receiving writing instruction, practice, and goal instructions, included in the other conditions.

Each child assigned to the process goal plus progress feedback condition received feedback 3-4 times during each session. This feedback conveyed to children that they were making progress toward their goal of learning to use the strategy's steps to write paragraphs. Feedback was delivered to each child privately during the independent practice phases. The teacher used such statements as:

> You're learning to use the steps.
> You're using the steps to write paragraphs.
> You're getting good at using the steps.
> You're doing well because you followed the steps in order.

This goal progress feedback should not be confused with performance feedback concerning children's planning and composing (e.g., "That's a good idea to include in your paragraph"). All children received performance feedback; only children assigned to the process goal plus feedback condition received progress feedback.

Posttest

The posttest included (in order) measures of perceived progress in strategy learning, strategy value, self-reported strategy use, self-efficacy, and writing achievement. For the progress measure, children privately judged how well they could use the strategy compared with when the project began. The 10-unit scale ranged from not better--10, to a whole lot better--100. The self-efficacy and the self-reported strategy use tests were identical to those of the pretest; a parallel form of the skill test was used. Cronbach's alpha for the posttest measures was .90 (efficacy) and .84 (skill). The strategy value measure consisted of a 10-unit scale ranging from 10--not much, to 90/100--a whole lot. Children judged how much they felt the strategy's steps helped them write paragraphs.

Maintenance Test

This test was administered six weeks following the posttest, during which time children received no supplementary strategy instruction. The test included strategy use, self-efficacy and achievement. Measures were identical to those of the posttest except a parallel form of the skill test was used. Cronbach's alpha was .96 (efficacy) and .82 (skill).

To obtain additional information on strategy use and achievement we administered a think-aloud procedure a week after this test. The tester met privately with children individually and said he was interested in children's thoughts while writing. Children were given a topic and asked to write a descriptive paragraph in the same fashion as they did during the project. The tester told children to say aloud everything they thought about but he did not remind them of the strategy. He wrote down students' verbalizations and prompted if they did not verbalize for several seconds. Verbalizations were scored by two raters who awarded one point for each step or close approximation; range of scores was 0 to 5. We did not count step one (choose a topic to write about) because we gave children the topic. We broke step five (write down the main idea and the other sentences) into two steps. Raters agreed on 37 of the 40 transcripts; the remaining three were averaged. Paragraphs also were scored for skill holistically and for words per T-unit.

Results

Preliminary ANOVAs yielded no significant between-conditions differences on pretest measures. There were no significant differences on any measure due to classroom or gender, nor were there significant interactions between condition, classroom, and gender. Within each condition there were no significant differences at each phase (pretest, posttest, maintenance test) between self-efficacy or skill scores on the four paragraphs covered during instruction and the two generalization paragraphs; therefore, data were pooled across categories. There were no significant within-conditions differences at each phase between the five strategy use scales; data were pooled across scales. Conditions did not differ in number of paragraphs worked on during instruction. Means and standard deviations of all measures are shown in Table 1. Except as noted, statistical tests were evaluated at the conventional $p < .05$ significance level.

Insert Table 1 about here

Posttest and maintenance test self-efficacy, writing skill, and words per T-unit were analyzed with MANCOVA; conditions constituted the treatment factor and corresponding pretest measures served as covariates. For the posttest measures the treatment effect was significant, Wilks's lambda = .260, $F(9, 75.60) = 6.21$. ANCOVA yielded significant effects for self-efficacy, $F(3, 35) = 2.92$; skill, $F(3, 35) = 11.72$; words per T-unit, $F(3, 35) = 14.98$.

Process goal plus feedback students judged self-efficacy higher than general goal students. Process goal plus feedback children outperformed general and product goal students on writing skill; process goal children scored higher than general goal students. Process goal plus feedback and process goal students wrote more words per T-unit than did product and general goal children.

Maintenance test measures yielded a significant treatment effect, Wilks's lambda = .344, $F(9, 75.60) = 4.63$. ANCOVA revealed significance for self-efficacy, $F(3, 35) = 3.01$; skill, $F(3, 35) = 10.49$; words per T-unit, $F(3, 35) = 6.72$. Process goal plus feedback children judged self-efficacy higher than general goal children. On writing skill, all conditions outperformed general goal students. Process goal plus feedback children wrote more words per T-unit than did product and general goal students; process goal children wrote more than general goal students.

Posttest and maintenance test self-reported strategy use scores were analyzed with ANCOVA using the pretest score as the covariate. These analyses were significant: posttest $F(3, 35) = 6.51$; maintenance test $F(3, 35) = 4.39$. Process goal plus feedback children reported greater strategy use than general goal students on the posttest and maintenance tests and greater use than product goal students on the posttest.

For the self-efficacy for skill improvement measure, ANCOVA using pretest self-efficacy for the corresponding type of paragraph as the covariate revealed significance for the narrative story, $F(3, 35) = 3.35$, and narrative descriptive paragraphs, $F(3, 35) = 4.03$. Process goal plus feedback children judged efficacy higher than general goal students on the story and narrative descriptive paragraphs and higher than product goal children on the latter paragraph.

ANOVA of the progress measure was significant, $F(3, 36) = 5.10$. Process goal plus feedback children judged progress greater than product and general goal students; process goal children judged progress higher than general goal children. ANOVA also yielded a significant result on the strategy value measure, $F(3, 36) = 7.13$. Process goal plus feedback students judged value higher than product and general goal children.

On the think-aloud data, verbalizations yielded a significant ANOVA, $F(3, 36) = 4.51$. The process goal plus feedback condition verbalized more steps than the general goal condition. The ANOVA for skill was significant, $F(3, 36) = 2.90$. Process goal plus feedback students outperformed general goal children.

Correlations were computed among instructional, posttest, and maintenance test measures. Given the large number of correlations, we report only those significant at the $p < .01$ level. Self-efficacy for improvement (averaged across the four weeks) correlated with posttest strategy use, self-efficacy, and skill. The latter three measures also were significantly intercorrelated, as were maintenance test strategy use, self-efficacy, and skill. Perceived progress and strategy value correlated positively with each other, with posttest strategy use and self-efficacy, and with maintenance test strategy use. Strategy value correlated positively with maintenance test self-efficacy.

Discussion

These results support the idea that providing children with writing strategy instruction and a goal of learning the strategy enhances self-efficacy and achievement more than strategy instruction alone. These results cannot be due to instructional differences, because students in all conditions were taught the writing strategy and received the same amount of practice.

One explanation is that providing students with a process goal highlights strategy use as a means to improve writing. Students may experience a sense of self-efficacy for attaining the goal, which is substantiated as they work on the task. Students who believe they are learning a useful strategy are apt to feel efficacious about improving their writing and motivated to apply the strategy (Borkowski, 1985; Schunk, 1989). In contrast, providing children with no explicit goal or a goal of writing paragraphs may convey that the strategy is less important for improving skills. When learners do not believe that a strategy may contribute much to their achievement, they may not employ it systematically or feel confident about improving their skills (Borkowski et al., 1987; Paris, Newman, & McVey, 1982).

Students who received process goals and progress feedback outperformed students assigned to the product-goal and control conditions. Progress feedback conveys to students that the strategy is effective, they are making progress in learning, and they are capable of continuing to improve (Paris et al., 1982). These beliefs are validated as students successfully apply the strategy. Progress feedback may be especially beneficial with writing, because young children may have difficulty determining whether they are progressing and whether strategy use is effective.

As predicted, we also found that combining process goals with progress feedback enhanced transfer of writing strategy use, skill, and self-efficacy. This finding is important, because research has not examined how process goals and progress feedback affect transfer and many strategy instruction studies find no evidence of transfer (Borkowski, 1985; Pressley et al., 1990). We hypothesized that the process goal and progress feedback would enhance transfer by raising perceived strategy usefulness and self-efficacy. This study provides indirect support for this idea. Process goal plus feedback students displayed higher maintenance efficacy compared with general goal children and judged strategy value higher than product and general goal students; value correlated positively with maintenance test strategy use and self-efficacy. Research is needed on the mechanism underlying transfer effects.

We recommend investigating students' strategy use over extended periods. Think-aloud transcripts of students engaged in writing tasks could determine how strategy use changes as self-efficacy and skills develop. This focus is consistent with current writing research employing think-aloud protocols to explore differences among writers differing in skill level (Scardamalia & Bereiter, 1986).

The present research supports the idea that self-efficacy is influenced by one's performances but is not merely a reflection of them (Bandura, 1986). Experimental conditions did not differ in the number of paragraphs completed during instruction, but the process goal enhanced self-efficacy. The belief that one can effectively apply a strategy that will improve one's performances can raise self-efficacy (Schunk, 1989). This study also shows that self-efficacy is positively related to skillful performance. Personal expectations for success are viewed as important influences on achievement by different theoretical approaches (Bandura, 1988; Covington, 1987; Weiner, 1985).

This research has implications for classroom practice. Many strategy training programs improve students' skills, but few specifically focus on building students' perceptions of their capabilities. High self-efficacy, coupled with knowledge of how to use a strategy and the belief that it raises performance, relates positively to strategy maintenance and generalization (Graham & Harris, 1989a, 1989b). Strategy training easily can be incorporated into regular classroom instruction, along with the goal of learning the strategy and feedback on goal progress. The present results suggest that an instructional program incorporating process goals and progress feedback helps to foster skills and self-efficacy.

References

Baker, L., & Brown, A. L. (1984). Metacognitive skills and reading. In P. D. Pearson (Ed.), Handbook of reading research (pp. 353-394). New York: Longman.

Bandura, A. (1986). Social foundations of thought and action. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1988). Self-regulation of motivation and action through goal systems. In V. Hamilton, G. H. Bower, & N. H. Frijda (Eds.), Cognitive perspectives on emotion and motivation (pp. 37-61). Dordrecht, The Netherlands: Kluwer Academic Publishers.

Bandura, A., & Schunk, D. H. (1981). Cultivating competence, self-efficacy, and intrinsic interest through proximal self-motivation. Journal of Personality and Social Psychology, 41, 586-598.

Borkowski, J. G. (1985). Signs of intelligence: Strategy generalization and metacognition. In S. Yussen (Ed.), The growth of reflection in children (pp. 105-144). New York: Academic Press.

Borkowski, J. G., Estrada, M. T., Milstead, M., & Hale, C. A. (1989). General problem-solving skills: Relations between metacognition and strategic processing. Learning Disability Quarterly, 12, 57-70.

Borkowski, J. G., Johnston, M. B., & Reid, M. K. (1987). Metacognition, motivation, and controlled performance. In S. J. Ceci (Ed.), Handbook of cognitive, social, and neuropsychological aspects of learning disabilities (Vol. 2, pp. 147-173). Hillsdale, NJ: Erlbaum.

Borkowski, J. G., Weyhing, R. S., & Carr, M. (1988). Effects of attributional retraining on strategy-based reading comprehension in learning-disabled students. Journal of Educational Psychology, 80, 46-53.

Covington, M. V. (1987). Achievement motivation, self-attributions and exceptionality. In J. D. Day & J. G. Borkowski (Eds.), Intelligence and exceptionality: New directions for theory, assessment, and instructional practices (pp. 173-213). Norwood, NJ: Ablex.

Flower, L., & Hayes, J. R. (1981). A cognitive process theory of writing. College Composition and Communication, 32, 365-387.

Graham, S., & Harris, K. R. (1989a). Components analysis of cognitive strategy instruction: Effects on learning disabled students' compositions and self-efficacy. Journal of Educational Psychology, 81, 353-361.

Graham, S., & Harris, K. R. (1989b). Improving learning disabled students' skills at composing essays: Self-instructional strategy training. Exceptional Children, 56, 210-214.

Hillerich, R. L. (1985). Teaching children to write, K-8: A complete guide to developing writing skills. Englewood Cliffs, NJ: Prentice-Hall.

Locke, E. A., & Latham, G. P. (1990). A theory of goal setting and task performance. Englewood Cliffs, NJ: Prentice-Hall.

Morgan, M. (1985). Self-monitoring of attained subgoals in private study. Journal of Educational Psychology, 77, 623-630.

Odell, L. (1981). Defining and assessing competence in writing. In C. R. Cooper (Ed.), The nature and measurement of competency in English (pp. 95-138). Urbana, IL: National Council of Teachers of English.

Paris, S. G., Newman, R. S., & McVey, K. A. (1982). Learning the functional significance of mnemonic actions: A microgenetic study of strategy acquisition. Journal of Experimental Child Psychology, 34, 490-509.

Pintrich, P. R., & De Groot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. Journal of Educational Psychology, 82, 33-40.

Pressley, M., Woloshyn, V., Lysynchuk, L. M., Martin, V., Wood, E., & Willoughby, T. (1990). A primer of research on cognitive strategy instruction: The important issues and how to address them. Educational Psychology Review, 2, 1-58.

Romberg, T. A., & Carpenter, T. P. (1986). Research on teaching and learning mathematics: Two disciplines of scientific inquiry. In M. C. Wittrock (Ed.), Handbook of research on teaching (3rd ed., pp. 850-873). New York: Macmillan.

Rosswork, S. G. (1977). Goal setting: The effects on an academic task with varying magnitudes of incentive. Journal of Educational Psychology, 69, 710-715.

Scardamalia, M., & Bereiter, C. (1986). Research on written composition. In M. C. Wittrock (Ed.), Handbook of research on teaching (3rd ed., pp. 778-803). New York: Macmillan.

Schunk, D. H. (1989). Social cognitive theory and self-regulated learning. In B. J. Zimmerman & D. H. Schunk (Eds.), Self-regulated learning and academic achievement: Theory, research, and practice (pp. 83-110). New York: Springer-Verlag.

Schunk, D. H. (1991). Goal setting and self-evaluation: A social cognitive perspective on self-regulation. In M. L. Maehr & P. R. Pintrich (Eds.), Advances in motivation and achievement (Vol. 7, pp. 85-113). Greenwich, CT: JAI Press.

Schunk, D. H., & Swartz, C. W. (1991, April). Process goals and progress feedback: Effects on children's self-efficacy and skills. Paper presented at the annual meeting of the American Educational Research Association, Chicago.

Shell, D. F., Murphy, C. C., & Bruning, R. H. (1989). Self-efficacy and outcome expectancy mechanisms in reading and writing achievement. Journal of Educational Psychology, 81, 91-100.

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. Psychological Review, 92, 548-573.

Weinstein, C. E., Goetz, E. T., & Alexander, P. A. (1988). Learning and study strategies: Issues in assessment, instruction, and evaluation. San Diego: Academic Press.

Weinstein, C. E., & Mayer, R. E. (1986). The teaching of learning strategies. In M. C. Wittrock (Ed.), Handbook of research on teaching (3rd ed., pp. 315-327). New York: Macmillan.

Zimmerman, B. J., & Martinez-Pons, M. (1990). Student differences in self-regulated learning: Relating grade, sex, and giftedness to self-efficacy and strategy use. Journal of Educational Psychology, 82, 51-59.

Table 1
Means and Standard Deviations

Measure	Phase	Experimental Condition: Product Goal	Process Goal	Process Goal + Feedback	Control
Self-efficacy	Pretest	59.3 (9.7)	59.3 (17.0)	63.0 (11.3)	58.7 (13.4)
	Posttest	74.6 (13.2)	77.5 (11.9)	89.1 (5.6)	67.7 (12.0)
	Maintenance	75.4 (18.6)	77.3 (18.7)	86.7 (7.1)	62.9 (18.3)
Skill	Pretest	7.4 (1.3)	7.6 (1.7)	7.7 (1.4)	7.6 (1.6)
	Posttest	9.9 (2.2)	10.8 (1.0)	12.0 (1.5)	8.2 (0.9)
	Maintenance	10.4 (2.7)	10.8 (0.8)	12.1 (1.3)	7.3 (2.6)
Words per T-unit	Pretest	7.1 (0.8)	6.1 (0.6)	7.4 (0.6)	7.2 (1.6)
	Posttest	6.5 (0.8)	7.7 (1.0)	7.8 (0.4)	6.1 (0.9)
	Maintenance	6.2 (1.3)	7.2 (0.5)	7.4 (0.4)	6.1 (1.1)
Strategy use	Pretest	66.4 (22.6)	65.0 (21.9)	60.8 (15.7)	62.2 (22.2)
	Posttest	70.4 (22.1)	76.8 (15.0)	89.6 (7.2)	63.0 (25.2)
	Maintenance	68.4 (25.2)	82.4 (14.9)	85.8 (9.4)	66.3 (23.7)
Self-efficacy for improvement	Week 1	76.4 (17.6)	72.0 (16.3)	85.6 (10.4)	74.6 (24.5)
	Week 2	76.4 (19.1)	73.8 (12.5)	87.4 (6.5)	71.0 (22.6)
	Week 3	73.2 (21.6)	75.8 (15.3)	89.8 (7.3)	65.8 (18.4)
	Week 4	71.6 (21.9)	72.6 (13.2)	90.4 (6.2)	66.6 (16.4)

table continues

Table 1 continued

Measure	Phase	Experimental Condition: Product Goal	Process Goal	Process Goal + Feedback	Control
Progress	Posttest	62.0 (31.2)	88.0 (15.7)	90.0 (11.0)	60.0 (24.0)
Strategy value	Posttest	50.0 (34.3)	75.0 (23.7)	93.0 (6.7)	54.0 (21.2)
Verbalizations	Think aloud	3.1 (1.4)	4.0 (0.9)	4.4 (0.8)	2.8 (1.2)
Skill	Think aloud	10.4 (3.1)	10.9 (2.9)	12.6 (1.9)	9.2 (2.6)
Words per T-unit	Think aloud	6.5 (1.3)	6.6 (0.8)	6.6 (1.1)	6.3 (1.3)

Note. Measures are described in the text.